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Specification

Order allocation management method and
order allocation management system

Field of the Invention

The present invention relates to an order
allocation management method and management
system thereof wherein optimum off-the-shelf
parts are automatically selected and allocated
by utilizing computer system on issuing
instructions for shipment processing of the
parts to be built up of a plurality of parts.

Description of the Related Art

In business where manufacturers deal with
customers directly, transactions utilizing
computer networks such as the Internet tend to
spread increasingly. A server provides product
information through the Internet, and customers
operate a computer terminal on their end to
select the products of their choices. Customers
select constructions and optional parts of the
products they desire to purchase and request
final estimates to the server through on-line.
When the server returns the estimate, the
customers place their orders after checking the
detail. Once the server has received the orders
from the customers, the server gives order
information to a host computer. Based on the
order information, the host computer
automatically issues instructions and the like
for shipment processing of the parts consisting
the products. The instructions are transferred
to assembly lines of personal computer,
warehouses, and management departments to
proceed shipping processing. The sales cost can
be remarkably reduced if all steps from ordering

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to issuing of instruction are automatically
processed by utilizing computer system.

However, the conventional technique described
above had the following problem to be solved.
At the time of issuing final estimates to
customers, the inventory of the parts consisting
the products are checked in order to allocate
the parts to be used. More specifically, the
estimates are issued only after all parts
inventory has been confirmed. However, certain
time-lag exists until the order is finalized
after the estimate is issued to the customer in
quite a few cases. Also, in some cases,
shipment cannot be processed until the reception
of payment is confirmed even the order is
finalized. Meantime, a number of customers
connect to the server through on-line and place
order continuously. At this point, if some
parts are allocated to the order while other
allocated parts are reserved at the time of
estimate and the order is not finalized after
issuing the estimate, then the parts will not be
shipped. In this case, it is desirable to
process automatically to optimize the parts
allocation system for first-in first-out
processing of the parts and the like.

Disclosure of the Invention

The present invention adapts the following
construction to solve the problem described
above.

<Construction 1>

An order allocation management method which
performs the processing to create an order parts
list after allocating the parts existing in the

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inventory list based on the order information to
record on memory storage of the computer, to
refer each part listed on the latest inventory
list for the priority order information
indicating shipment priority order after the
order is confirmed; and to create the confirmed
parts list reallocating the above parts having
the highest priority.

The order information includes the information
parts estimate, processing of customer ordering
and the like. An order will be confirmed after
the processing such as the receipt of payment .
The parts can be either finished products or
partly finished products. This invention is an
invention that computer automatically processes
the allocation of equivalent parts when the
parts being allocated after referring the
inventory list and like at the time of ordering
become out of some time stock between ordering
and order confirmation. To match with the order
parts list, parts in the inventory list are
individually allocated. Each part in the
inventory list is attached with priority order
information indicting shipment priority order.
The parts having the highest priority order in
the list is subject to be shipped first.

Automatic reallocation allows to first-in
first-out processing even when the parts are
not out of stock. More specifically, the parts
are still in stock at the time of reallocation
even the parts are already allocated based on
the order information, and the parts can be
allocated for the confirmed order considering
first-in first-out processing.

Equivalent parts include parts having the same
model number but different manufacturer, parts
having the same manufacturer but different

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manufacturing date, and parts having the same
model number but different purchase price. The
parts include an intangible option and the like
found in various services besides the parts of
the products to be actually sold. In addition
to the latest inventory list, the memory storage
of the computer includes the priority order
information of each part to be allocated for
order processing. The priority order
information is the information indicating which
parts have priority in shipment when two or more
equivalent parts exist. Shipping direction
based on the confirmed parts list described
above automatically optimizes the allocation of
off-the-shelf parts in a manner such as first-in
first-out management.

<Construction 2>

An order allocation management method according
to construction 1, wherein the priority order
information includes priority information
according to time of parts purchase.

When a plurality of equivalent stock exists, one
of the parts will be allocated. It is possible
to allocate one of the parts, but for instance,
give the parts having old purchase date with
high priority order. This method enables first-
in first-out management among the parts and
alternative parts.

<Construction 3>

An order allocation management method according
to construction 1, wherein the priority order
information includes priority information
according to purchase price.

For instance, when the purchase prices of parts have been changed, the parts purchased at higher price are given with higher priority order. The purchase prices of the parts normally decrease gradually, it is possible to manage in first-in first-out manner by giving a priority to the parts purchased before price change. When the prices are the same, priority order information at the time manufacture, for instance, can be used as a standard.

<Construction 4>

An order allocation management method according to construction 1, wherein the priority order information includes priority information according to the constructions of the parts.

When the constructions of parts have been changed, it is possible to manage in first-in first-out manner by giving a priority to the parts before construction change. When the constructions are the same, priority order information at the time manufacture, for instance, can be used as a standard.

<Construction 5>

An order allocation management method according to construction 1, wherein the order parts list is created by allocating the parts actually existing in the inventory list.

This is the method to specifically allocate the parts confirmed to be in stock at the time of ordering.

<Construction 6>

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An order allocation management method according
to construction 1, wherein said order allocation
management method creates order parts list by
displaying the parts' names of the parts
existing in the inventory list.

This is the method to display the parts' names
only in the order parts list if the parts are in
stock at the time of ordering and to execute
actual and specific allocation after the order
is confirmed.

<Construction 7>

An order allocation management method according
to construction 1, wherein the confirmed part
list is created by reallocating the parts with
highest priority order out of all the equivalent
parts for the parts existing in the inventory
list including the part being listed up on the
order parts list.

The optimization of reallocation is performed by
temporarily allocating the parts in the order
parts list and checking the priority order of
all equivalent parts in the inventory list after
the order is confirmed.

<Construction 8>

The order allocation management method according
to construction 1, wherein the confirmed parts
list is created by reallocating the parts with
highest priority order out of all the equivalent
parts for the parts listed up on the order parts
list, but not found in the inventory list.

This is the method to reallocate only the parts
being out of stock in the order parts list when
the order is confirmed.

<Construction 9>

An order allocation management method according
to any of the construction 1 or 8, wherein the
order allocation method allocates the parts
having the highest priority order to build up
finished products based on a tree-shaped list in
which the finished products are placed on the
trunk, and equivalent parts are individually
placed on a plurality of branches branched from
the same trunk.

The finished product are placed on the trunk
closest to the root of the tree in the tree-
shaped list. Each branch can be a trunk to
build up the parts placed on each branch. In
this manner, freely branched tree-shaped list is
obtained. The assembly parts needed to build up
the finished products will be outlined on its
pathway when tracing back the list considering
the priority order from the root to the terminal
branch. This enables the combination of
allocation parts by computer processing to
simplify.

<Construction 10>

An order allocation management method according
to construction 9, wherein the tree-shaped
list is created such that all parts, placed on
its pathway when the above tree-shaped list is
traced back from the root to any of the terminal
branch by selecting one of the plurality of
branched branches, consist of only normally
functioning parts by combining each other.

Even if accessories of the equivalent parts are
different, a parts list clearly showing the
combination of the parts and its accessories are

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required. Creating tree-shaped list allows to uniquely allocate all correct parts by tracing back the list in order. The most appropriate parts combination is selected by performing process considering the priority order of the parts.

   <Construction 11>

An order allocation management method according to construction 10, wherein the order allocation management method allocates each part such that all parts, placed on its pathway when the above tree-shaped list is traced back from the root to any of the terminal branch by selecting one of the plurality of branched branches based on the stock list and priority order information, consist of combination of the parts having the highest priority to build up the finished products shown in the root.

This process allows computer system to create a part combination list considering the inventory list and priority order information directly from the tree-shaped list without man-assisted handling and to issue shipping instructions and the like.

   <Construction 12>

An order allocation management system comprising: order parts list creation means to create the order parts list allocating the parts existing in the inventory list based on the order information and to store in the memory storage of the computer; and

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confirmed   parts list creation means to execute
processing to create a confirmed part list for
each parts existing in the latest inventory list
after confirmation by reallocating each of the
above parts having high priority order by
referring to the priority order information
showing the shipment priority order.

This is a system invention to execute the method
described in construction 1.

 <Construction 13>

An order allocation management method according
to construction 12, wherein the confirmed parts
list creation means allocates the parts having
the highest priority order to build up the
finished product based on the tree-shaped list
in which the finished products are placed on the
trunk, and equivalent parts are individually
placed on a plurality of branches branched from
the same trunk.

This is a system invention to execute the method
described in construction 9.

<Construction 14>

An order allocation management method according
to construction 13, wherein the above tree-
shaped list is such that all parts, placed on
its pathway when the tree-shaped list is traced
back from the root to any of the terminal branch
by selecting one of the plurality of branched
branches, consist of only normally functioning
parts by combining each other.

This is a system invention to execute the method described in construction 10.

<Construction 15>

An order allocation management method according to construction 14, wherein the confirmed parts list creation means is such that all parts, placed on its pathway when the above tree-shaped list is traced back from the root to any of the terminal branches by selecting one of the plurality of branched branches based on the stock list and priority order information, consist of combination of the parts having the highest priority to build up the finished products shown in the root.

This is a system invention to execute the method described in construction 11.

<Construction 16>

A computer readable recording media which records computer program to execute in sequence processing to create an order parts list allocating the parts existing in the inventory list based on the order information and to store in the memory storage of the computer; and to create a confirmed part list regarding each part existing in the latest inventory list after confirmation by reallocating each of the parts having high priority order by referring to the priority order information showing the shipment priority order.

Brief Description of The Drawings

FIG.1 is a block diagram showing an embodiment of the present invention system.

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FIG.2 is a diagram describing the contents of
priority order.
FIG.3 is an operation flowchart showing the
present invention system.
FIG.4 (a) and (b) are schematic diagrams showing
different operation models of the present
invention system.
FIG.5 is a diagram describing the contents of
equivalent parts list and confirmed parts list
created based on the priority order.
FIG.6 is an operation flowchart describing the
operation of confirmed parts list creation means.

Best embodiment of the invention

An embodiment of the present invention will be
described below with reference to the drawings.

(Embodiment 1)

This system can be used to optimize the part
allocation of products in the following case,
for instance. First, according to the orders of
the products from four customers K1, K2, K3, and
K4, parts A1, A1, A2, and A2 for the products
are individually allocated for each customer.
Part A1 and A2 worth exactly the same values and
either one of them can be allocated, but A1 has
an older manufacturer date. Stocks of these
parts have been confirmed at the time of
ordering. However, customers K1 and K4 made an
payments right away and their orders were
confirmed, but the payment from customers K2 and
K3 were delayed, and their order confirmations
were delayed. In this case, parts reallocation
is performed at the time when the orders of
customers K1 and K4 were confirmed. More
specifically, reallocation of parts A1, A1 is
performed individually for customers K1 and K4.
Later, reallocation of parts A2, A2 is performed

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individually for customers K2 and K3 when the orders of customers K2 and K3 are confirmed. Consequently, equivalent parts A1, A1, A2, and A2 will be shipped in order of the length of time from the manufacturer's date regardless of the allocation order.

Here, let's take direct sale system of personal computer as an example. If it is designed such that customer can chose the construction of personal computer in detail, various parts of personal computer is subject to be ordered together. For each of these parts, allocation processing considering individual stock status at the time of ordering is required. When the number of parts is large, reallocation processing at the time of order confirmation become quite complex. The present invention automatically processes reallocation through computer.

FIG.1 is a block diagram showing an embodiment of the present invention system. A system in the figure comprises a server 10, order parts list creation means 11, confirmed parts list creation means 12 and memory storages 21, 22, 23, 24. The memory storage 21 stores an order parts list 31. This order parts list 31 is created by allocating off-the-shelf parts when a customer places an order. In this example, before an order is confirmed, it is called an order parts list 31, and a list created after the order is confirmed and reallocation is processed, it is called a confirmed part list 34.

The memory storage 22 stores the inventory list 32. The inventory list 32 is the latest list to be updated at appropriate timing. The order parts list creation means 11 is a computer program to perform processing in creating order

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parts list at the time of ordering by referring
this inventory list 32 and after confirming its
inventory. The memory storage 23 stores a
priority order information 33. The priority
order information 33 provides information
indicating which part is shipped by priority
when two or more equivalent parts exist. This
information is used for such first-in first-out
management. The confirmed parts list creation
means 12 is a computer program to perform
processing in creating confirmed parts list by
referring the inventory list 32 and the priority
order information 33 when the order is confirmed.

FIG.2 is a diagram describing the contents of
priority order. When two or more equivalent
parts exist, older parts are shipped in order
for first-in first-out management. Therefore,
the older parts are selected and being allocated
at the time of order confirmation. Whether the
parts are new or old, for instance, will be
decided by the time of purchasing as a standard.
Also, besides the time of purchasing, factors
determining the shipping order of the parts can
vary. As shown in the figure, priority order
indicating which part needs to be shipped faster
shall be determined by considering purchase
price, construction, and other various factors
collectively. The results will be recorded in
the column of total order. When the equivalent
parts differ only by the model number, decision
that which parts are shipped faster will be
automatically determined based on the priority
order information. When model numbers of a
plurality of parts are the same and their
priority numbers are the same as well, any parts
can be allocated first.

In the example shown in the figure, the type of
off-the-shelf parts of part A is A1, A2, A3, and

A4. These stock numbers are also recorded. The
confirmed parts list creation means 12 checks if
any parts are fully in stock at the time of
order confirmation. If the parts are in stock,
based on the total order, part A1 is firstly
given a priority for allocation. When part A1
becomes out of stock, part A2, the second in the
total order will be allocated. When this part
A2 becomes out of stock, it will be designed
that part 3, the third in the total order is
allocated.

Furthermore, date processing of the inventory
list will be described here using the example
explained earlier. If there are parts A1, A1,
A2, and A2 in the inventory list, Parts A1, A1,
A2, and A2 are allocated individually when each
customer places an order. Every time a part is
allocated, a flag indicating already being
allocated will be put on an attribute data. The
parts with no flag are subject to be allocated
when the first order is placed. Parts A1 and A2
worth exactly the same values and either one of
them can be allocated, but A1 has an older
manufacturer date. Then, customers K1 and K4
made payments right away and their orders were
confirmed, but the payments from customers K2
and K3 were delayed, and their order
confirmations were delayed. In this case, parts
reallocation is performed including the parts
with flags at the time when the orders of
customers K1 and K4 were confirmed.

Furthermore, all parts A1, A1 A2, and A2 have
the flags in this example, but all parts
regardless of the presence and absence of the
flag are subject to be reallocated. First,
reallocation of the parts A1, A1 is performed
individually for customers K1 and K4. This
confirms the allocation of parts A1, A1, thus

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the parts will be removed from the inventory
list or will be excluded from the targets for
the subsequent reallocation. At this point,
only A2, A2 are available for reallocation.
Furthermore, reallocation of the parts A2, A2 is
performed individually for customers K2 and K3
when the orders of customers K2 and K3 are
confirmed. If there is new shipment of the
equivalent parts up to this point, there will be
no reallocatable parts in the inventory list.
In this manner, parts will be shipped in order
of the length of time from the manufacturer's
date regardless of the allocation order.

FIG.3 is an operation flowchart showing the
present invention system.

A detailed operation of the present invention
system will be described with reference to FIG.3
and FIG.1.

First, an order information 15 is entered
through a server 10 at Step S1. If the content
of the order information 15 are parts with their
names A, B, C, and D, in Step S2, the order
parts list creation means 11 refers to an
inventory list 32. Then, in accordance with the
order information, the stock of parts A2, B3, C1,
and D2 will be allocated. The order parts list
created 31 at Step S3 will be stored in the
memory storage 21.

In the next Step S4, the order confirmed
information 16 will be entered through the
server 10. In the Step S5, the confirmed parts
list creation means 12 read out the order parts
list 31 from the memory storage 21.

Furthermore, only parts in the stock will be
listed up for the identical part name with the

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parts in the order parts list 31 by referring
the latest inventory list at Step S6.   For
instance, if there is no part A2 in the stock,
the parts A1, A3 and A4 will be listed up for
part's name A.   In the next Step S7, which parts
on the list should be given a priority for
shipment will be selected by referring the
priority order information 33.   If the part A3
is selected here, in Step S8, the chosen part A3
is written on the confirmed parts list.

Next, in Step S9, whether the processing from
Step S6 to Step S8 for all the parts have been
completed will be determined.   If it was not
completed, return to Step S6.   When the
processing from Step S6 to Step S8 for all parts
are completed, finish a series of processing by
writing the confirmed parts list at Step S10 on
the memory storage 24.   The confirmed parts list
34 stored on the memory storage 24 will be
transferred to shipping department, for instance,
to be used for the printing and the like of
request instructions.

FIG.4 (a) and (b) are schematic diagrams showing
different operation models of the present
invention system.

In FIG.4(a), the order parts list creation means
11 creates order parts list that listing only
the parts' names of the ordered parts based on
the order information 15.   More specifically,
the order parts list creation means 11 only
checks the presence of the corresponding parts'
names by referring the inventory list 32 and
simply stores the order information 15 on the
memory storage 21.   More specifically, the
checks of the presence or absence of the parts
in stock or its allocation are not required.   If
the ordered parts have been already checked

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whether they are targeted parts for the
inventory at the time of ordering, the order
parts list may be simply created from the order
information. More specifically, order parts
list creation means 11 does not need to refer to
the inventory list. Then, the confirmed parts
list will be created in exactly the same process
when the order is confirmed. In the case of
this example, the processing to create the order
parts list is facilitated, and stored data is
also simplified. Furthermore, optimization is
realized without fail as the confirmed parts
list 34 is created only after the latest
inventory list 32 and the priority order
information are referred.

In FIG.4(b), the order parts list creation means
11 creates the order parts list 31 considering
the priority order by referring the inventory
list 32 and the priority order information 33.
In this manner, the confirmed parts list
creation means 12 can create the confirmed parts
list 34 by using the exact contents in the order
parts list 31 as long as the stocked parts exist.
More specifically, only the parts out of stock
are reallocated using the priority order
information.

Furthermore, in the cases being described using
FIG.1 and FIG.4(a), confirmed parts list
creation means 12 can be designed to create the
confirmed parts list 34 by using the exact
contents in the order parts list 31 as long as
the stocked parts exist.

FIG.5 is a diagram describing the contents of
equivalent parts list and confirmed parts list
created based on the priority order.
If, for instance, assembly parts of a processor
(substrate loaded with a processor) and a heat

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sink in the figure for the parts of the personal computer is available. The assembly parts like this need to be allocated as a set. Furthermore, if there are two kinds of heat sinks attachable to a processor , one of them needs to be allocated in accordance with the above priority order. Optimization method of the parts reallocation processing using the priority order information for such assembled parts will be described below.

As shown in the figure, an equivalent parts list 30 is a so called hierarchical structured data like a branch. This equivalent parts list 30 is designed to place a finished product "type K personal computer by Company A " on the position of a trunk 41 and equivalent parts are placed in order on branches 42 and 43 branched from this trunk 41. Using this tree as an example, allocation process of the assembled parts of the processor and the heat sink will be described. The confirmed parts list 35 lists up the assembled parts to be allocated considering the priority order.

If there are two kinds of equivalent processors here to be used for a personal computer , a processor xxx is placed on the branch 42 and a processor yyy is placed on the branch 43. These two kinds of processors in the figure have the same model number but different manufacturer's dates. Also, in the case where the constructions of an accessory, a heat sink is slightly different due to the different manufacturer's date shown.

If there are two kinds of equivalent heat sink attachable to the processor xxx , at this time, if branch 42 where processor xxx is placed were a trunk, heat sink ha is placed on the branch 45

and heat sink hb is placed on the branch 46.
Also, if there are two kinds of equivalent heat
sinks attachable to the processor yyy , at this
time, if branch 43 where processor yyy is placed
were a trunk, heat sink ha is placed on the
branch 47 and heat sink hc is placed on the
branch 48.

In this manner, when type K personal computer by
Company A is being built up, there are two
kinds of equivalent parts available for
processor only and four kinds if the combination
with heat sinks is included. Furthermore, the
heat sink ha is attachable to both processor xxx
and processor yyy, but heat sink hb is
attachable to processor xxx only, and the heat
sink hc is attachable to processor yyy only.

If this kind of allocation of the parts is
manually performed, extensive knowledge of parts
and a number of their manuals will be required.
In this example, a tree-shaped list as shown in
the figure is created automatically by utilizing
the computer system to show the combination
pattern of the equivalent parts to build up a
finished product. This part allocation
processing allows computer system to select
easily and automatically the appropriate
combination of the parts after the order is
confirmed.   More specifically, it is designed
such that all parts, placed on its pathway when
the tree-shaped list is traced back from the
root to any of the terminal branch by selecting
one of a plurality of branched branch in the
figure, consist of only normally functioning
parts by combining each other.

When the branch 42 and branch 46 in the
equivalent parts list 30 in the figure are
traced back from the trunk 41 as shown with the

broken line arrow, a confirmed parts list 35
indicating a parts group such that a processor
xxx and heat sink hb are attached on the type K
personal computer by A firm. Other parts of
this personal computer, for instance, hard disk
drive, floppy disk drive, display and the like
can be selected in a similar manner. In a case
where a plurality of mutually closely related
parts are combined to obtain finished products,
the creation of the tree-shaped list allows
computer system to uniformly perform parts
selecting processing considering the priority
order previously explained.

Furthermore, both equivalent parts lists 30
shown in FIG.5 are equivalent in light of
function, one of them can be freely selected to
assemble a personal computer for the shipment.
Next, the operation of the confirmed parts list
creation means 12 shown in FIG.1 will be
described. Its general operation is the same as
the one explained in FIG.1 or FIG.3, operations,
especially an unique operation when the tree-
shaped equivalent parts list 30 in FIG.5 is used
will be mainly explained.

FIG.6 is an operation flowchart describing the
operation of the confirmed parts list creation
means. First, parts' names placed on the
individual branch are obtained by tracing all
branches from the trunk of the equivalent part
list 30 in FIG.5 in Step S1. In this manner,
off-the-shelf parts list is referred for all
parts listed in the equivalent parts list 30 in
the next Step S2 and the presence or absence of
the stock will be determined at Step S3. If the
parts are in stock, jump to Step S5. If not,
the parts will be removed from the equivalent
parts list 30 as the parts can not be used. At
this point, terminal side of the tree from the

branch that the parts are placed, more
specifically, the opposite side of the branch
against the trunk will be entirely removed.

In Step S5, whether the above processing was
completed for all parts should be determined and
the processing from Step S1 to Step S5 will be
repeated. In this manner, after the equivalent
parts list is organized such that all parts
placed on the individual branch on the
equivalent parts list 30 are in stock, the
selection of parts considering the priority
order will be started. First, in Step S6, type
K personal computer by A firm on the trunk of
the equivalent parts list 30 is traced back to
downward in order. If a branch is not diverged
when it moves from the trunk to the branch, the
parts placed on the trunk or individual branch
are simply transferred to the confirmed parts
list. However, each branch is diverged in the
example shown in FIG.5. When a diverged branch
is detected, the branch with higher priority
order is selected (Step S7) and the parts of the
chosen branch in the confirmed parts list are
included (Step S8). In Step S9, it is
determined whether next branch is available, and
if the next branch is available, return to Step
S7 to repeat the same processing. The above
operations complete the optimized parts
selection considering priority orders of the
off-the-shelf parts.

Furthermore, an order sales system of a personal
computer was used as an example above, however
this invention can be widely applied for various
parts of ordering sale. Even not in the case of
finished products and parts, the present
invention allows to allocate the optimum
alternative parts for paired parts which are
sold together. Also, for instance, this

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invention can be used for services such as tours and the like organized by a travel agent. For instance, the assignment of hotel room can be processed by granting equivalent rooms as the above equivalent parts. This invention allows automatically to optimize room assignment when travel request is actually placed after the travel reservation.

Also, in the example above, the order sale system utilizing the Internet was explained, but the present invention can be widely used for a system in which reallocation of the parts is performed eventually for parts production and shipment after the manufacturer places an order for parts and the parts are allocated.

Furthermore, each functional block shown in the embodiment above can consist of individual program module or combined program module. Also, part of these functional blocks can be consisted from a logical circuit hardware. Also, each program module can be operated by combining pre-existing application programs or be operated as an independent program.

The computer program to realize the present invention described above can be stored in a computer readable recording media such as CD-ROM and be installed for use. Also, this program can be used by downloading in the computer memory through a network. In these cases, it is desirable to establish automatic processing for optimizing reallocation of the parts to facilitate first-in and first-out operation of the parts.